



July 15, 2021

Climate and Security in the Middle East and North Africa

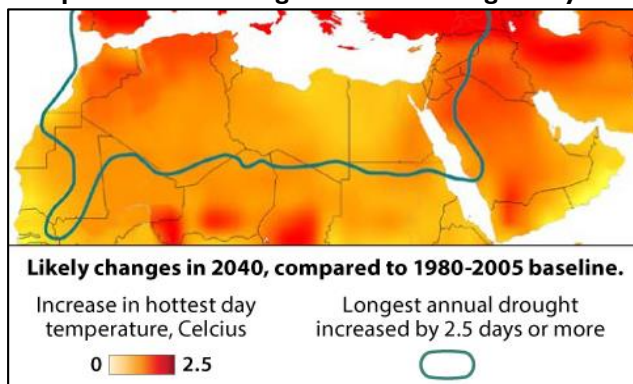
The Middle East and North Africa (MENA) region is among the world's most water-stressed and vulnerable to climate change. Policymakers' concerns about a changing MENA climate include not only physical and economic impacts but also the potential implications for political stability and security in a volatile region.

A Dry Region Under Stress

Projections of various effects of climate change on the largely arid and semi-arid MENA region are available, although regional analyses are often constrained by limited data for MENA and downscaling from global models. Given MENA's geographic span—from Morocco to Iran—and topographic variation (e.g., mountains, deserts, and deltas), local effects may differ from regional trends.

Heat. Temperatures in the MENA region have increased for decades and are projected to continue increasing in coming decades through the end of the century. **Figure 1** shows one projection of hottest day temperature increases by 2040. Some research suggests intensifying warm-season heat extremes in the region (e.g., Zittis et al. in *Climate and Atmospheric Science*, 2021). Hotter conditions generally increase energy demand for cooling and may negatively affect health, labor, and agricultural productivity.

Figure 1. 2040 Projections for MENA: Hottest Day Temperatures and Longest Annual Drought Days



Source: CRS adapted from U.S. National Intelligence Council (NIC), *Global Trends 2040*, March 2021. The projections used the Representative Concentration Pathway 4.5. NIC identified the data source as Schwingshackl, Sillman, and the Centre for International Climate and Environmental Research and the graphic source as Pardee Center University of Denver.

Water. Both droughts and floods occur in MENA, with variability over time and place. Several studies project increasingly lengthy droughts in some parts of MENA. These include annual dry spells projected to last longer by 2040 (**Figure 1**). Many (but not all) studies project less precipitation along MENA's Mediterranean coast through this century; less agreement exists over whether

precipitation may increase or decrease in other parts of the MENA region (e.g., Arabian Peninsula, Sahara portion of various North Africa countries). Regarding precipitation extremes, some studies (e.g., Ozturk et al. in *Atmosphere*, 2021) project an increase in precipitation amounts on very wet days for the end of this century for much of the region, which may contribute to flooding.

Rising sea levels are encroaching on coastal ecosystems and communities, thereby contributing to more frequent flooding and more extensive coastal storm flooding. According to some researchers, by 2050, portions of Iraq's second-largest city of Basra and other southern Iraqi areas could experience chronic coastal flooding. Alexandria, Egypt, one of the most populous coastal cities in the Middle East, also could be regularly flooded by rising sea levels.

Agriculture and Food. Much of MENA's agriculture and food production is rain-fed or consists of livestock. Production and many rural agricultural livelihoods are sensitive to changes in heat, drought, and precipitation patterns. Additionally, some production in the region relies on irrigation, which can be sensitive to surface water availability and can contribute to overuse of aquifers. Limited arable land, water scarcity, and other resources and environmental constraints limit regional agricultural production. The region has coped with population growth and urbanization by importing food. Reliance on food imports is anticipated to persist, with demographic and diet trends and changing agricultural growing conditions (e.g., potential productivity losses) as contributing factors.

How Climate May Interact with Security

U.S. national security assessments have described climate change as a *threat multiplier* that may exacerbate existing tensions in regions facing other challenges, like intra-state conflict, rapid population growth, urbanization, or poor governance. The chain of linkages from climate and weather events to political stability is complex, with intervening critical factors such as social schisms and governance. In the MENA region, where several countries (Syria, Iraq, and Lebanon) are divided along ethnic/sectarian lines, armed sub-state actors and terrorist groups could broaden their appeal to sectors of the population disaffected by physical hardships wrought by climate change.

Various examples illustrate how climate conditions and weather events, such as droughts and heatwaves, could affect MENA's future in terms of political unrest, violent conflicts, and the well-being of its people. For instance, rising or spiking food prices or water shortages previously have triggered urban unrest in the region. Reliance on food imports links MENA's internal stability to agricultural conditions in exporting nations. Poor conditions in

agricultural exporting countries contributed to reduced MENA food imports and associated food shortages in 2010-2011. In the case of Syria, decades of land and groundwater overuse in the nation's breadbasket, combined with a 2006-2010 drought and periods of spiking global oil and food prices, played a part in agricultural workers migrating to cities, where many were unable to find employment. When Syria's uprising began in 2011, displaced rural migrants formed the base of opposition against the Assad regime. In North Africa, local protests about water shortages reportedly occurred in 2017-2018. In Iraq, observers identified droughts as undermining rural Sunni livelihoods, which some argue may have helped fuel Islamic State recruitment.

Some countries will be able to afford expensive, new adaptations ... but in many MENA countries, governments' inability to address water and heat challenges will increase public frustration with government performance and potentially spark new migration flows.
— U.S. National Intelligence Council, 2021 *Five-Year Regional Outlook: Middle East and North Africa*

Climate change is anticipated to challenge the capacities to adapt of poorer countries and politically unstable governments. For example, in Iraq, rising daily temperatures and more frequent heat extremes since the 1970s contribute to the demand for air conditioning. Peak summer electricity demand has exceeded generation capacity in Iraq's electricity sector, which has been affected by decades of war, corruption, and government mismanagement. Some public protests have expressed frustration over power shortages, as many Iraqis cannot afford private generators to cope with summer heat.

Variations across the region in national wealth and state capacity to respond to climate and weather events may lead to different efforts toward adaptation, such as improving regional drought monitoring, investing in water conservation and efficiency (e.g., Israel's water reuse), and shifting to more heat-resilient crop varieties. Studies for the World Bank project that reduced water availability in the region may contribute to a decrease in gross domestic product over time.

Energy and Emissions Policies

Some oil-rich members of the Gulf Cooperation Council (GCC, composed of Saudi Arabia, the United Arab Emirates [UAE], Kuwait, Oman, Qatar, and Bahrain) have undertaken efforts to diversify their economies. In 2021, Saudi Crown Prince Mohammed bin Salman Al Saud announced that Saudi Arabia, the world's second-largest oil producer, seeks to generate half of its domestic energy from renewable sources by 2030; this target is part of the Crown Prince's "Vision 2030" to diversify the kingdom's economy away from hydrocarbons. However, these types of pledges have engendered some skepticism. If the United States and Europe reduce their hydrocarbon dependency and domestic production, GCC state-owned oil companies may increase

production to meet rising energy demands from China, India, and elsewhere.

Other MENA countries that are net hydrocarbon importers are adjusting or may adjust their energy policies. For example, Morocco has attempted to reduce its dependence on fossil fuel imports and increase its domestic renewable energy output by building large concentrated solar power capacity. Morocco's government announced in 2019 that renewable sources composed an estimated 35% of its electricity production the prior year. Morocco aims to generate over half of its electricity from renewable sources by 2030.

Leading up to the United Nations Framework Convention on Climate Change (UNFCCC) Conference of Parties in November 2021 (COP26), some countries are pledging new emissions reduction goals. These goals, or Nationally Determined Contributions (NDCs), represent each country's own commitment to meeting the objectives of the Paris Agreement, a UNFCCC agreement intended to reduce the effects of climate change. As of June 2021, two MENA countries—the UAE and Lebanon—had submitted updated NDCs. Eleven other MENA countries, including Saudi Arabia, have previously submitted NDCs but have not updated them. Five MENA countries did not ratify the Paris Agreement; some of these submitted intended NDCs, while others did not. Meeting some emissions reduction goals may prove difficult for MENA region countries. According to the Climate Action Tracker (CAT, an organization which tracks government climate actions), Saudi Arabia and the UAE are not on a trajectory to meet their NDC targets, while Morocco appears likely to achieve its pledge.

Recent Related U.S. Efforts and Policies

In April 2021, President Biden hosted a summit on climate for 40 world leaders, including some leaders from the MENA region. At the summit, the Biden Administration committed to exerting U.S. leadership in addressing climate change. The Department of State and the U.S. Agency for International Development are to coordinate "U.S. government efforts to support countries around the world to enhance and meet their climate goals in ways that further their national development priorities." The White House also announced a "Net-Zero Producers Forum," composed of the United States, Canada, Norway, Qatar, and Saudi Arabia, for developing ideas to reduce energy-related emissions. Also in April 2021, the United States and the UAE announced the Agriculture Innovation Mission for Climate, which is expected to launch at COP26, to accelerate global research and development on agriculture and food systems to support climate action.

Jeremy M. Sharp, Specialist in Middle Eastern Affairs
Nicole T. Carter, Specialist in Natural Resources Policy
Kezee Procita, Senior Research Librarian

IF11878

Disclaimer

This document was prepared by the Congressional Research Service (CRS). CRS serves as nonpartisan shared staff to congressional committees and Members of Congress. It operates solely at the behest of and under the direction of Congress. Information in a CRS Report should not be relied upon for purposes other than public understanding of information that has been provided by CRS to Members of Congress in connection with CRS's institutional role. CRS Reports, as a work of the United States Government, are not subject to copyright protection in the United States. Any CRS Report may be reproduced and distributed in its entirety without permission from CRS. However, as a CRS Report may include copyrighted images or material from a third party, you may need to obtain the permission of the copyright holder if you wish to copy or otherwise use copyrighted material.